



[10191/1975]

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES**

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In re Application of: :
Harald Beck et al. :
For: METHOD AND DEVICE FOR :
CONTROLLING A WHEEL BRAKE :
OF A VEHICLE :
Filed: September 27, 2001 : Art Unit: 3683
Serial No.: 09/965,776 :
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MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF PURSUANT TO 37 C.F.R. § 41.37

SIR:

On July 16, 2007, the U.S. Patent and Trademark Office (the "Office") mailed a Notification of Non-Compliant Appeal Brief (the "Notification") regarding Appellants' previously-filed Appeal Brief. The present paper is a revised Appeal Brief which addresses issues raised in the Notification.

On February 12, 2004, the Office received Appellants' Notice of Appeal from the final rejection of claims 1, 3, 5, 7, 8 and 10 contained in the Final Office Action issued by the Office on October 10, 2003 in the above-identified patent application.

For at least the reasons set forth below, the final rejection of claims 1, 3, 5, 7, 8 and 10 should be reversed.

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R 0036098

1. REAL PARTY IN INTEREST

The real party in interest in the present appeal is Robert Bosch GmbH of Stuttgart in the Federal Republic of Germany. Robert Bosch GmbH is the assignee of the entire right, title and interest in the present application.

2. RELATED APPEALS AND INTERFERENCES

There are no interferences or other appeals related to the present application, which "will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal".

3. STATUS OF CLAIMS

Claims 2, 4, 6 and 9 have been cancelled.

Claims 1, 3, 7, 8 and 10 were finally rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,053,584 to Schunck et al.

Claims 1, 3, 5, 7, 8 and 10 were finally rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,332,654 to Yano.

Appellants appeal from the final rejections of pending and considered claims 1, 3, 5, 7, 8 and 10. A copy of all of the pending and considered claims 1, 3, 5, 7, 8 and 10 is attached hereto in the Appendix.

4. STATUS OF AMENDMENTS

In response to the Final Office Action mailed on October 10, 2003, Appellants filed a Request for Reconsideration (Response After Final), which was mailed on December 4, 2003; however, the Request for Reconsideration did not include any amendments.

5. SUMMARY OF CLAIMED SUBJECT MATTER

The claimed subject matter is described as follows, and is directed to addressing the following problems and/or providing the following benefits.

Generally speaking, one problem encountered in generating a braking pressure or braking force in a vehicle according to a driver-stipulated input is that the driver-stipulated input may be impractical in certain situations. For example, in a situation in which the vehicle is standing still, implementing the braking pressure or force directly according to

driver-stipulated input may result in uncomfortable vehicle operation (such as adjustment, pump and valve noises), unnecessarily burdened electrical, hydraulic or control components, etc. See the Specification at page 1, line 27, to page 2, line 24. The present invention therefore relates to a method and a device for controlling a wheel brake of a vehicle that addresses at least this problem. See the specification at page 2, line 32, to page 3, line 15.

Claim 1 is directed to *a method of controlling a wheel brake of a vehicle, an electrically operated actuator being assigned to the wheel brake and being drivable by an actuation signal as a function of a setpoint to generate at least one of a braking force and a braking pressure*. FIG. 1 depicts an exemplary control device, including a control unit 100 having a microcontroller 102 which executes programs, that can be used to implement the method of controlling of claim 1. FIG. 1 also depicts an exemplary actuator that can be controlled according to claim 1, i.e., pump 42. FIG. 1 is described in the Specification at, e.g., page 4, line 30, to page 5, line 22. Additionally, FIG. 2 is a flow chart representing features of the method of claim 1. FIG. 2 is described in the Specification, e.g., at page 9, line 10, to page 11, line 27. The individual features of the method of claim 1 are further described below.

The method of claim 1 includes the feature of *determining a desired braking input based on at least one of a brake pedal operation and at least one other control system*. The desired braking input is the braking input that is based on both driver intent (such as in the form of a depressed brake pedal) and other control systems (such as anti-skid controllers). See the Specification at, e.g., page 5, line 24, to page 6, line 19; and page 9, lines 22-25. See also, e.g., FIG. 2 at step 150.

The method of claim 1 also includes the feature of *applying the at least one of the braking force and the braking pressure as a function of the desired braking input*. The braking force or pressure is applied to the wheel of the vehicle using the actuator, such as the pump 42 shown in FIG. 1. See the Specification at, e.g., page 5, line 24, to page 7, line 8; and page 10, lines 4-6 and 11-14. See also, e.g., FIG. 2 at steps 154 and 160.

The method of claim 1 also includes the feature *wherein the applied at least one of the braking force and the braking pressure is limited to a maximal value when the vehicle is at a standstill*. In the case of the vehicle being at a standstill, direct implementation of the drivers intent may be unnecessary, and the brake force or pressure is limited to avoid the undesired consequences discussed above (such as uncomfortable vehicle operation or

unnecessarily burdened brake system components). Therefore, in this case, the brake pressure or force is limited to a value which, e.g., is sufficient keep the vehicle in a standstill state. See the Specification at, e.g., page 6, line 19, to page 7, line 22; and page 9, line 25, to page 10, line 21. See also, e.g., FIG. 2 at steps 156 and 158.

FIGS. 3a-c also depict a timeline for an exemplary embodiment of features of the method of claim 1. FIGS. 3a-c are described in the Specification at page 11, line 29, to page 12, line 28.

Claim 3 depends on claim 1, and includes the additional feature of *wherein at least one of the braking pressure and the braking force is limited to a predefined value when the vehicle is at a standstill*. The braking force or pressure, which in claim 1 is limited to a maximal value when the vehicle is at a standstill, is limited to a *predefined value* according to claim 3. The predefined value can accommodate certain known factors, such the weight of the vehicle, or an expected possible incline of, e.g., 30°. See the specification at, e.g., page 6, line 25, to page 7, line 8; page 9, line 36, to page 10, line 4; and page 11, lines 14-18. See also, e.g., FIG. 2 at step 156.

Claim 5 also depends on claim 1, and includes the additional feature of *increasing a limit value if the vehicle is detected going from a standstill to a rolling state*. If the vehicle is detected as going from a standstill to a rolling state, the maximal limit value is increased in order to bring the vehicle back to a standstill state. This can account for system deviations, such as due to, e.g., damaged brake linings. See the Specification at page 7, lines 10-22; page 10, lines 14-21; page 11, lines 20-22. See also, e.g., FIG. 2 at steps 162 and 164.

Claim 7 also depends on claim 1, and includes the additional feature of *wherein a valve connects a first and a second pressure control circuits*. That is, in one embodiment of the method, an additional advantage is achieved by only using only one of a plurality of pressure control circuits to control the braking pressure in the standstill condition. By doing such, the burden on, and wear of, the hydraulic components can be reduced and their lifetime lengthened. According to claim 7, the valve connects the first and second pressure circuits, thus allowing a single pressure regulator to apply pressure to a plurality of wheels under certain conditions. See the Specification at, e.g., page 7, line 24, to page 8, line 11; and page 12, line 30, to page 14, line 9. Additionally, FIG. 4 is a flowchart which depicts features of claim 7.

The method of claim 7 includes the feature of *driving the valve in the at least one predefined operating situation to connect the first and the second pressure control circuits*. That is, in an appropriate predefined operating situation, such as, e.g., the standstill situation, the valve that connects the first and second pressure control circuits is driven. Connecting the pressure control circuits allows control of two different wheel brakes by just one pressure regulator. See the Specification at, e.g., page 12, line 35, to page 13, line 6; and page 13, lines 18-25. See also, e.g., FIG. 4, at steps 200 and 206.

The method of claim 7 also includes the feature of *regulating the pressure by one of the first and second pressure control circuits while another one of the first and the second pressure control circuits is at least one of deactivated and converted to a pressure holding mode*. That is, when the first and second pressure circuits are connected, only one pressure regulator is needed, and the other may be either deactivated or placed in a holding mode. See the specification at page 7, line 34, to page 8, line 5; and page 13, line 21, to page 14, line 9. See also, e.g., FIG. 4, at steps 208, 210 and 214.

Claim 8 depends on claim 1, and includes the additional feature of *wherein a limit value is based on at least one wheel brake not being braked*. That is, in one embodiment vehicle braking during standstill is achieved while braking with less than all of the wheel brakes of the vehicle. This provides the additional advantage of reducing the burden on, and wear of, the unused braking components. See the Specification at page 8, line 27, to page 9, line 1; and page 14, lines 11-37. See also, e.g., FIG. 5.

Claim 10 is directed to a *device for controlling a wheel brake*. The features of claim 10 are similar to those of claim 1. That is, claim 10 can be thought of as a device to implement the method of claim 1. Moreover, as discussed above in regard to claim 1, FIG. 1 depicts an exemplary embodiment of a device according to claim 10.

Claim 10 includes the feature of *a control unit to control at least one electrically operated actuator assigned to the wheel brake*. As discussed above in regard to claim 1, FIG. 1 depicts control unit 100 which can control a wheel brake actuator. As also discussed above, FIG. 1 depicts an exemplary electrically operated actuator, i.e., pump 42.

Claim 10 also includes the feature wherein *the control unit is operable to control as a function of a desired braking derived from an operation of at least one of a brake pedal and at least one other control system, and converting at least one of a magnitude and a change of the operation into the actuation quantity*. This feature of claim 10 is similar to the features of

claim 1 including *controlling a wheel brake of a vehicle, an electrically operated actuator being assigned to the wheel brake and being drivable by an actuation signal as a function of a setpoint to generate at least one of a braking force and a braking pressure; and determining a desired braking input based on at least one of a brake pedal operation and at least one other control system; and applying the at least one of the braking force and the braking pressure as a function of the desired braking input.* As such, the above discussion of these features of claim 1 applies to this feature of claim 10, including reference to particular portions of the Specification and Drawings.

Claim 10 also includes the features of *wherein the control unit is operable to limit actuation of the at least one electrically operated actuator in at least one predefined operating situation, and the desired braking is limited to a maximal value in at least one of the magnitude of the desired braking and dynamics of the change of the desired braking; and wherein the at least one predefined operating situation includes the vehicle being at a standstill.* These features of claim 10 are similar to the features of claim 1 including *wherein the applied at least one of the braking force and the braking pressure is limited to a maximal value when the vehicle is at a standstill.* As such, the above discussion of these features of claim 1 applies to this feature of claim 10, including reference to particular portions of the Specification and Drawings.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1, 3, 7, 8 and 10 are anticipated under 35 U.S.C. § 102(b) by U.S. Patent No. 6,053,584 to Schunck et al.

Whether claims 1, 3, 5, 7, 8 and 10 are anticipated under 35 U.S.C. § 102(e) by U.S. Patent No. 6,332,654 to Yano.

7. ARGUMENT

A. **The Rejection Under 35 U.S.C. § 102(b) That Claims 1, 3, 7, 8 and 10 Are Anticipated by the Schunck Reference**

Claims 1, 3, 7, 8 and 10 stand finally rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 6,053,584 to Schunck et al. (the “Schunck reference”). Appellants respectfully submit that the Schunck reference does not anticipate the present claims for the following reasons and respectfully submit that the present rejection should be reversed.

As regards the anticipation rejection of the claims, to reject a claim under 35 U.S.C. § 102, the Office must demonstrate that each and every claim feature is identically described or contained in a single prior art reference. (See Scripps Clinic & Research Foundation v. Genentech, Inc., 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991)). Furthermore, with regard to the claimed features, it is well established that “claims are not to be read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their broadest reasonable interpretation.” See In re Marosi, 710 F.2d 799 (Fed. Cir. 1983) (quoting In re Okuzawa, 537 F.2d 545, 548 (CCPA 1976)).

Independent claim 1 of the present invention relates to a method of controlling a wheel brake of a vehicle and recites, *inter alia*, the step of applying the at least one of the braking force and the braking pressure as a function of the desired braking input, wherein the applied at least one of the braking force and the braking pressure is limited to a maximal value when the vehicle is at a standstill.

The specification of the present invention sheds light on the meaning of this claim language where it clearly provides:

If it was found in step 152 that the vehicle is at a standstill, then a check may be performed in next step 156 to determine whether setpoint PRADSOLLFW, derived from the driver's desired braking, is greater than a predefined limit value PRADSOLLGRENZ, which represents the standstill limit pressure. If this is not the case, the brake pressure may be set as part of pressure regulation as in normal operation according to step 154. If the setpoint derived from the driver's intent (input) is greater than the limit value, then according to step 158, setpoint PRADSOLL to be set is reduced to the limit value, starting from setpoint PRADSOLLFW derived on the basis of the

driver's intent (input), following a predefined time function $\Delta l(t)$.
(page 9, line 36 to page 10, line 11, emphasis added)

In light of one of the main objectives of the present invention – to reduce unnecessary loading – this passage indicates that when an applied braking pressure (load) exceeds a limit value PRADSOLLGRENZ, that the pressure derived from the driver's intent is overridden in favor of a limit or maximal value to avoid application of forces that are greater than necessary to maintain the standstill condition of the vehicle.

The Schunck reference does not disclose this claimed feature. In contrast, the Schunck reference relates to a technique of reducing sudden changes in deceleration when coming to a standstill whereby a control system overrides a driver's braking commands and implements a progressive diminution in brake pressure so that the deceleration drops monotonously from an initial level to lower levels. (See the Schunck reference, col. 3, lines 28-35.) As can be discerned, the Schunck reference does not mention or refer to a limit or maximal pressure and also does not pertain to a standstill condition as such, but rather, pertains to smoothing out a transition from braking to standstill, i.e., the deceleration of the vehicle to zero velocity.

In the Advisory Action, the Examiner states that “the setpoint which is calculated independent of the brake pedal box in box 208 is the pressure limit.” The Schunck reference describes this procedure that the Examiner is referring to (box 208) as follows:

If speed VREF is less than [a second speed threshold V0] this threshold, the individual setpoints for the wheels are determined in step 208 taking into account the modified braking force distribution BKVSS. The normal braking force distribution between the rear wheel brakes and front wheel brakes is changed in this case. This can also be accomplished by suitably selecting the time functions for the rear and front wheel brakes in step 200, which reduce the front wheel brake pressures differently from the rear wheel brake pressures. (col. 3, line 66 to col. 4, line 8)

Whether or not the threshold condition $VREF < V0$ is equivalent for testing for a standstill condition as the Examiner alleges (see Final Office Action, paragraph 5) — which is not admitted — there remains no disclosure of a standstill limit pressure. Instead, the Schunck reference merely indicates that “pressures are selected so that deceleration drops monotonously from the initial level to lower levels” (col. 3, lines 34-35). Thus, while the claimed invention seeks to limit an absolute pressure that can be applied during a standstill so

as to avoid unnecessary loading, i.e., the pressure itself is the targeted variable, in the Schunck reference, the pressure chosen is secondary since the rate of deceleration is the targeted variable.

For these reasons, it is not understood how the Examiner maintains that the Schunck reference discloses limiting the applied braking force or braking pressure to a maximal value when the vehicle is at a standstill, as recited in claim 1.

As it is clear that the Schunck reference does not identically disclose these features, it is submitted that the Schunck reference does not anticipate claim 1 or claims 3, 7 and 8, which depend from claim 1. Since independent claim 10 recites features analogous to those discussed above with respect to claim 1, it is submitted that claim 10 is also not anticipated by the Schunck reference.

Reversal of the rejection of claims 1, 3, 7, 8 and 10 under 35 U.S.C. § 102(b) based on the Schunck reference is, therefore, respectfully requested.

**B. The Rejection Under 35 U.S.C. § 102(e)
That Claims 1, 3, 5, 7, 8 and 10 Are
Anticipated by the Yano Reference**

Claims 1, 3, 5, 7, 8 and 10 stand finally rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,332,654 to Yano (the “Yano reference”). Appellants respectfully submit that the Yano reference does not anticipate the present claims for the following reasons and respectfully submit that the present rejection should be reversed.

To reject a claim under 35 U.S.C. § 102, the Office must demonstrate that each and every claim feature is identically described or contained in a single prior art reference. (See Scripps Clinic & Research Foundation v. Genentech, Inc., 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991)). Furthermore, with regard to the claimed features, it is well established that “claims are not to be read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their broadest reasonable interpretation.” See In re Marosi, 710 F.2d 799 (Fed. Cir. 1983) (quoting In re Okuzawa, 537 F.2d 545, 548 (CCPA 1976)).

As noted above, independent claim 1 relates to a method of controlling a wheel brake of a vehicle and recites, *inter alia*, the step of applying the at least one of the braking force and the braking pressure as a function of the desired braking input, wherein the applied at

least one of the braking force and the braking pressure is limited to a maximal value when the vehicle is at a standstill.

The Yano reference relates to a grade-holding brake system used for maintaining a brake pressure and a stopped condition after release of the brake pedal. (See e.g., the Abstract.) The Yano reference describes the details of an embodiment of this system in Figs. 9, 10, 11 and 12 and the accompanying text (col. 9, line 50 to col. 12, line 7). With respect to Fig 12, item 1207 refers to a “pressure decreasing operation”. As indicated in Fig. 12, this pressure decreasing operation is performed when a Ycntrl flag is set, an absolute value of a ZdP parameter is not less than an XdP parameter, and the ZdP parameter is not greater than zero. The accompanying text explains that step 1207 involves several sub-steps shown in Fig. 13C which include: holding a cut-off valve in a closed position for a predetermined period of time (thereby maintaining the pressure at the wheel brake cylinders for a predetermined period of time, since by having the cut-off valve closed, fluid cannot flow back away from the wheel brakes); opening the cut-off valve, closing the pressure booster valve; and turning the pressure booster pump off. (See col. 11, lines 25-32.) In this manner, the Yano reference states, “it is possible to appropriately compensate for the pressure deviation [between the actual and target pressure levels]”.

The Yano reference describes in an immediately preceding passage a converse pressure increasing process used when the actual pressure is lower than the target pressure in which the cut-off valve is similarly held closed for a predetermined period of time, but then the pressure booster valve is opened and the pressure booster pump is turned on for a predetermined period of time. (See col. 11, lines 9-15.) With respect to this latter process, it is stated that “if the predetermined periods of time for controlling the pressure booster valve and . . . pump are set at values corresponding to the pressure deviation ZdP, it is possible to appropriately compensate for the pressure deviation” (col. 11, lines 16-20).

In the Advisory Action, the Examiner explains his reasoning as to why he believes that the Yano reference anticipates the claimed subject matter as follows:

*The Target value of Yano is an upper limit to the pressure applied.
The pressure is being controlled as to not rise above that value and
therefore, the target value can be construed as an upper limit.
Furthermore, the argument that Yano teaches an adjustment method
rather than a limit method is irrelevant ... (Advisory Action,
paragraph 5).*

It is submitted that the Examiner's analysis is incorrect, and in fact, takes an overbroad view that reads limitations completely out of the claims. The fact that the Yano reference prescribes a target pressure, in general, does not mean that it discloses limiting an applied braking force or braking pressure to a maximal value when the vehicle is at a standstill, particularly when the Yano reference describes an opposite procedure of “increasing the pressure within each wheel cylinder 6 when the brake pedal is depressed and when the vehicle is stopped, and the pressure within each wheel cylinder 6 is set at a sufficient level to keep the vehicle stopped” (col. 11, lines 60-67). With regard to this process, the Yano reference specifically states that if Zdp (the difference between a target wheel cylinder pressure and a current wheel cylinder pressure) is greater than zero, i.e., if the target pressure is higher than the current pressure, the pressure is increased to the target level. (See col. 11, lines 1-5.)

Clearly then, the target pressure level does not function as a ceiling or upper limit pressure level as recited (“braking pressure is limited to a maximal value”), since if the current pressure is below this level, it is increased to the target level. A reasonable interpretation of the claim language “limited to a maximal value” is that this means that the pressure is limited to prevent it from going above this level.

In this regard, while it is understood that limitations are not imported into the claims from the specification of which they are a part, the clear guidance within the specification of the present invention that “if [the brake pressure is not above the limit standstill level] the brake pressure may be set as part of pressure regulation as in normal operation according to step 154, [while] if the setpoint derived from the driver's intent (input) is greater than the limit value, then according to step 158, setpoint PRADSOLL to be set is reduced to the limit value,” clarifies that the setting of the maximal level establishes a ceiling level rather than a target level. Therefore, it is submitted that the Examiner is incorrectly equating the “target level” of the Yano reference with the “maximal level” as claimed, and that the Yano reference does not anticipate the subject matter of claim 1.

As claims 3, 5, 7 and 8 depend from claim 1, they are equally not anticipated by the Yano reference. Since independent claim 10 recites features analogous to those discussed above with respect to claim 1, it is submitted that claim 10 is also not anticipated by the Yano reference.

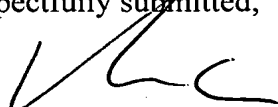
Reversal of the rejection of claims 1, 3, 5, 7, 8 and 10 under 35 U.S.C. § 102(e) based on the Yano reference is, therefore, respectfully requested.

CONCLUSION

In view of the above, it is respectfully requested that the rejections of claims 1, 3, 5, 7, 8 and 10 reversed, and that these claims be allowed as presented.

Respectfully submitted,

Dated: 15 Aug 2007

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[10191/1975]

CLAIMS APPENDIX

1. A method of controlling a wheel brake of a vehicle, an electrically operated actuator being assigned to the wheel brake and being drivable by an actuation signal as a function of a setpoint to generate at least one of a braking force and a braking pressure, the method comprising:

determining a desired braking input based on at least one of a brake pedal operation and at least one other control system; and

applying the at least one of the braking force and the braking pressure as a function of the desired braking input;

wherein the applied at least one of the braking force and the braking pressure is limited to a maximal value when the vehicle is at a standstill.

3. The method of claim 1, wherein at least one of the braking pressure and the braking force is limited to a predefined value when the vehicle is at a standstill.

5. The method of claim 1, further comprising increasing a limit value if the vehicle is detected going from a standstill to a rolling state.

7. The method of claim 1, wherein a valve connects a first and a second pressure control circuits, further comprising:

driving the valve in the at least one predefined operating situation to connect the first and the second pressure control circuits; and

regulating the pressure by one of the first and second pressure control circuits while another one of the first and the second pressure control circuits is at least one of deactivated and converted to a pressure holding mode.

8. The method of claim 1, wherein a limit value is based on at least one wheel brake not being braked.

10. A device for controlling a wheel brake, the device comprising:

a control unit to control at least one electrically operated actuator assigned to the wheel brake;

wherein:

the control unit is operable to control as a function of a desired braking derived from an operation of at least one of a brake pedal and at least one other control system, and converting at least one of a magnitude and a change of the operation into the actuation quantity; and

the control unit is operable to limit actuation of the at least one electrically operated actuator in at least one predefined operating situation, and the desired braking is limited to a maximal value in at least one of the magnitude of the desired braking and dynamics of the change of the desired braking;

wherein the at least one predefined operating situation includes the vehicle being at a standstill.

EVIDENCE APPENDIX

Appellants have not submitted any evidence pursuant to 37 C.F.R. §§ 1.130, 1.131 or 1.132, and do not rely upon evidence entered by the Examiner.

RELATED PROCEEDINGS APPENDIX

There are no interferences or other appeals related to the present application.